REMARKS

The Examiner is thanked for the performance of a thorough search. By this amendment, Claims 1, 3, 26, 35, 36, 45, 47, 51, and 54 have been amended. No claims have been cancelled or added. Hence, Claims 1-56 are pending in the Application. It is respectfully submitted that the amendments to the claims as indicated herein do not add any new matter to this application. Furthermore, amendments made to the claims as indicated herein have been made to correct typographical errors, and to improve readability and clarity of the claims.

Each issue raised in the Office Action mailed December 19, 2002 is addressed hereinafter. It is respectfully submitted that the rejection of Claims 1-56 are over come for reasons given hereafter.

DRAWINGS

Formal drawings will be filed if the application is allowed or otherwise requested by the Examiner.

SUMMARY OF REJECTIONS/OBJECTIONS

In the Office Action, Claims 33, 35, 36, and 45 recite the limitation "the data repository (claim 33) and in claim A1 and are rejected under 35 U.S.C. § 112 as having insufficient antecedent basis for this limitation in the claim.

Claims 1-5, 14-19, 22-26, 36-44, 47-50, 51 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over "An Open Agent Architecture" by Cohen.

Claims 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over "An Open Agent Architecture" by Cohen in view of "Development Tools for the Open Agent Architecture" by Martin.

Claims 20, 21, 27-35, 45, 46, 51, 52 and 54-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over "An Open Agent Architecture" by Cohen in view of "Information Brokering in an Agent Architecture" by Martin.

REJECTIONS UNDER 35 U.S.C. § 112

CLAIMS 33, 35, 36, and 45

In the Office Action, Claims 33, 35, 36, and 45 recite the limitation "the data repository (claim 33) and in claim A1 and are rejected under 35 U.S.C. § 112 as having insufficient antecedent basis for this limitation in the claim. Claims 35, 36, and 45 are amended according to correct for sufficient antecedent basis. Thus, the amendments to the claims as indicated herein have been made in view of the Office Action's rejection under 35 U.S.C. § 112 and to improve clarity of the claims.

REJECTIONS UNDER 35 U.S.C. § 103(a)

CLAIMS 1, 26, 51 and 54

Claim 1 recites, in part, the features:

> "the facilitating engine further operable for generating a goal satisfaction plan associated with the base goal, wherein the **goal satisfaction plan** includes:
> a suitable delegation of sub-goal requests to best complete the requested service request by **using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms**."

Claim 1 has been amended to clarify that the facilitating engine uses sophisticated reasoning when delegating sub-goal requests to best complete the requested service request. The facilitating engine's use of reasoning is supported by the specification on page 13, lines 342-347. Amended Claim 1 requires that the

facilitating engine use "reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms.

For purposes of explanation, assume that the facilitator receives a request such as, "Make Coffee". The facilitator's facilitating engine uses reasoning to generate the following goal satisfaction plan:

Sub-goal request A: Roast coffee beans
Sub-goal request B: Grind coffee beans
Sub-goal request C: Boil water, etc.

The facilitating engine is able to use reasoning to accomplish the base goal, "Make Coffee". The reasoning includes "one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms." For example, the facilitating engine uses its domain-specific reasoning based on domain-specific knowledge of symbols and axioms of the domain. In the above example, the facilitating engine uses its knowledge about domain symbols and axioms such as "coffee", "roast", and "beans" in order to generate a goal satisfaction plan by reasoning that making coffee entails roasting coffee bean, grinding coffee beans and boiling water, etc. Also, the coffee beans need to be roasted before the coffee beans can be ground and that only after the coffee beans are ground should water be boiled.

Further, the facilitating engine is able to use reasoning to delegate the sub-goals to service providing agents in such a way as "to best complete the requested service request." For example, assume that several agents are able to roast coffee. The facilitating engine is able to use reasoning to delegate the sub-goal task of roasting coffee to the service-providing agent that can roast beans in the least amount of time

because the facilitating engine has reasoned that the least amount of time taken to make coffee is the best way to accomplish the base goal of making coffee.

Similarly, to use an example taken directly from the specification (see page 28, starting at line 759 to page 29, line 762-763), the facilitating engine accomplished the request "Remind Bob about lunch" by reasoning that all available message transfer agents (e.g., fax, phone, mail, pager) are to be enabled to **compete** for the opportunity to carry out the request. In other words, the base goal is carried out not by merely parsing the request into sub-goals **based on the syntax** of the request. Rather, the facilitating engine used reasoning to decide upon using **competing** message transfer agents to reminding Bob of lunch, in lieu of delegating the task to just one message transfer agent.

In contrast, *Cohen*'s "AN Open Agent Architecture" and *Martin's* "Information Brokering in An Agent Architecture" fail to teach the goal satisfaction plan that entails the type of reasoning described above as performed by the facilitator agent. In *Cohen*, the blackboard merely performs temporal reasoning, which is NOT the same as "domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms. Temporal reasoning in *Cohen* refers to events that are to be triggered when a condition is satisfied. For example, page 4 of *Cohen*, under "Example Scenario", discloses that the statement, "When mail arrives for me about a security break, get it to me" causes the blackboard to perform temporal reasoning associated with the word **"When"** in the above statement. Thus, in *Cohen*, the blackboard installs a trigger in the mail agent for sending mail messages about a security break. The triggering event in this case is when such mail arrives.

Martin's "Information Brokering in An Agent Architecture" merely discloses query processing and a query execution plan which is NOT the same as a goal execution plan. Thus, *Martin* is merely describing a method for information retrieval rather than fulfillment of a service request. Moreover, query execution plans are well-known in database systems. In database systems, query statements are made in query languages such as SQL. SQL statements are fulfilled according to a query execution plan based on the manner in which information is stored in the database. In contrast, the goal satisfaction plan is a plan that entails reasoning rather than being based on the manner in which information is stored in a database.

Further, *Martin* merely teaches that the queries are systematically broken based on syntax of the queries without any kind of reasoning for forming a goal satisfaction plan such as that of the "Make Coffee" example above.

Neither *Cohen* nor *Martin*, either alone or in combination, disclose, teach, suggest or make obvious the novel features of claim 1. Thus, Claim 1 is allowable.

Claims 26, 51 and 54, each contain similar features regarding the use "reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms. Thus, Claims 26, 51 and 54 are allowable for at least the reasons provided herein in respect to Claim 1.

CLAIMS 2-21, 27-46, 52, and 55-56

Claims 2-21 are either directly or indirectly dependent upon Claim 1 and include all the limitations of Claim 1 and therefore are allowable for at least the reasons provided herein in respect to Claim 1.

Claims 27-46 are either directly or indirectly dependent upon Claim 26 and include all the limitations of Claim 26 and therefore are allowable for at least the reasons provided herein in respect to Claim 26.

Claim 52 is directly dependent upon Claim 51 and includes all the limitations of Claim 51 and therefore is allowable for at least the reasons provided herein in respect to Claim 51.

Claims 55-56 are either directly or indirectly dependent upon Claim 54 and include all the limitations of Claim 54 and therefore are allowable for at least the reasons provided herein in respect to Claim 54.

CLAIMS 22, 47 and 53

Claim 22 recites, in part, the feature:

"at least one agent capable of making a request directly to a server agent as a peer to peer communication for accomplishment of at least one of the sub-goals."

Neither *Cohen* nor *Martin*, either alone or in combination, disclose, teach, suggest or make obvious the novel feature, "at least one agent capable of making a request directly to a server agent as a peer to peer communication for accomplishment of at least one of the sub-goals" of Claim 22.

In fact, *Cohen* **teaches away** from "at least one agent capable of making a request directly to a server agent as a peer to peer communication". On page 2 of *Cohen*, it is specifically stated that "All communications between client agents **must pass through the blackboard.**" In other words, the client agents must communictae via the blackboard. Thus, there is no peer to peer direct communication between client agents.

The examiner contends that peer to peer communication "is obvious since *Cohen* teaches the originating agent is capable of directly communicating with a target agent." It is respectfully submitted that there is nothing in *Cohen* that teaches that the originating agent is capable of directly communicating with a target agent. However, on page 2 , 2d paragraph, *Cohen* does mention that "[c]ommunication can also take place in a directed mode if the originating agent specifies the identity of a target agent." In this case, **directed mode** means that the originating agent can tell the blackboard about target agent but nonetheless, the communication **must pass through the blackboard**. The directed mode differs from the undirected mode in that the undirected mode refers to the brokering function performed by the blackboard. In the directed mode, the blackboard goes directly to the target agent to get the answer to the posted query.

Neither *Cohen* nor *Martin*, either alone or in combination, disclose, teach, suggest or make obvious the novel features of claim 22. Thus, Claim 22 is allowable.

Claims 47 and 53, each contain similar features regarding peer to peer communications between client agents. Thus, Claims 47 and 53 are allowable for at least the reasons provided herein in respect to Claim 22.

CLAIMS 23-25, 48-50

Claims 23-25 are either directly or indirectly dependent upon Claim 22 and include all the limitations of Claim 22 and therefore are allowable for at least the reasons provided herein in respect to Claim 22.

Claims 48-50 are either directly or indirectly dependent upon Claim 47 and include all the limitations of Claim 47 and therefore are allowable for at least the reasons provided herein in respect to Claim 47.

CONCLUSION

For the reasons set forth above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a formal Notice of Allowance is believed next in order, and that action is most earnestly solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is encouraged to call the undersigned at (650) 838-4311.

The Commissioner is authorized to charge any fees due to Applicant's Deposit Account No. 50-2207.

Respectfully submitted,
Perkins Coie LLP

Date: 4-21-03

Carina M. Tan
Registration No. 45,769

Correspondence Address:

Customer No. 22918
Perkins Coie LLP
P. O. Box 2168
Menlo Park, California 94026
(650) 838-4300

~~Highly Scalable Software-Based Architecture For Communication And Cooperation Among Distributed Electronic Agents~~

~~ABSTRACT~~

~~A highly flexible, software-based architecture is disclosed for constructing distributed systems. The architecture supports cooperative task-completion by flexible, dynamic configurations of autonomous electronic agents. Communication and cooperation between agents are brokered by one or more facilitators, which are responsible for matching requests, from users and agents, with descriptions of the capabilities of other agents. It is not generally required that a user or agent know the identifies, locations, or number of other agents involved in satisfying a request, and relatively minimal effort is involved in incorporating new agents and "wrapping" legacy applications. Extreme flexibility is achieved through an architecture organized around the declaration of capabilities by service-providing agents, the construction of arbitrarily complex goals by users and service-requesting agents, and the role of facilitators in delegating and coordinating the satisfaction of these goals, subject to advice and constraints that may accompany them. Additional mechanisms and features include facilities for creating and maintaining shared repositories of data; the use of triggers to instantiate commitments within and between agents; agent-based provision of multi-modal user interfaces, including natural language; and built-in support for including the user as a privileged member of the agent community. Specialized embodiments providing enhanced scalability are also described.~~